BIOTIC COMMUNITY

Fish Community

During 1992-95, fish were sampled at 70 sites on 38 basin streams using seines and backpack and boat electrofishing methods (Figure fs). Sixty-one species were collected. Thirty-nine additional species have been collected during other surveys for a total of 100 species (Table 8; MDC 1995c). Grass carp (Ctenopharyngodon idella), creek chubsucker (Erimyszon oblongus), spottedbass (Micropterus punctulatus), warmouth (Lepomis gulosus), and redear sunfish (Lepomis microlophus) (Table 8) were collected outside of the range described by Pflieger (1975). Seven other species have distributions that overlap a portion of the basin (Pflieger 1975) but were not collected.

The entire basin lies within the Ozark Faunal Region (Pflieger 1989). During 1992-95, some of the most frequently collected fishes were typical Ozark species, such as smallmouth bass (Micropterus dolomieui), rock bass (Amploplites rupestris), longear sunfish (Lepomis megalotis), northern hogsucker (Hypentelium nigricans), black redhorse (Moxostoma duquesnei), greenside darter (Etheostoma blennioides), rainbow darter (Etheostoma caeruleum), Ozark minnow (Notropis nubilus), and striped shiner (Luxilus chrysocephalus).

Species diversity and number of Ozark species were lowest in lower Big River basin. Number of species was 47, 53, and 36 for upper (Big River RM 93-134 and tributaries), middle (Big River RM 59-93 and tributaries), and lower (Big River RM 0-59 and tributaries) basin streams, respectively. Number of representative Ozark species was 24, 25, and 21 for upper, middle, and lower basin streams, respectively. Negative effects of increasing urbanization surrounding lower basin streams may be responsible for their lower diversity.

Threatened and Endangered Species

Four species of concern are found within the basin. The crystal darter (Ammocrypta asprella) is on the State endangered list and was found in lower Big River (RM 1-8), but only by Pflieger (1975). The Missouri status of the Alabama shad (Alos alabamae) is rare and was infrequently sampled in Big River (RM 1-4). The western sand darter (Ammocrypta clara) is on Missouri's watch list and was found in lower Big River (RM 1-10). Silverjaw minnow (Ericymba buccata) distribution was scattered throughout Big River and lower portions of Calico Creek, Terre Bleue Creek, Flat River, and Salem Creek. It is on the State watch list, but was common where sampled.

Fish Introductions and Stockings

Rainbow trout have been stocked in Mill Creek by a private business in Cadet, MO, but the numbers and stocking frequency are unknown. Grass carp (Ctenopharyngodon idella), redear sunfish (Lepomis microlophus), and hybrid sunfish (species undetermined) are occasionally taken during sampling (unpublished data, K. Meneau, MDC) and are suspected to originate from overflow of private ponds.

Spotted bass were first collected in Big River by Mills et al. (1978), which was the first report of spotted bass in the Meramec River basin. Spotted bass were not collected again until 1987 (unpublished data, K. Meneau, MDC). Since then, spotted bass have greatly increased their numbers below RM 20 (becoming the dominant black bass) and expanded their range above RM 60. (unpublished data, K. Meneau, MDC). Also, genetic tests have revealed that some spotted bass/smallmouth bass hybridization has taken place (unpublished data, K. Meneau, MDC). Spotted bass may have entered the Meramec River basin as a result of stockings in the Osage River basin before 1940 or in Missouri River tributaries in the 1960s (Pflieger 1975).

Sport Fishing

Big River offers a variety of game fish, with the most popular being smallmouth bass. Big River is ranked third in Missouri for providing Master Angler smallmouth. In 1992, MDC established a Smallmouth Bass Special Management Area (SBBSMA; Figure fm) on Big River. During 1994 within the SBBSMA, electrofishing by MDC revealed good numbers of quality-sized fish (Figure sf). In MDC's 1995 creel survey, anglers reported catching 4,726 smallmouth bass including seven of Master Angler size, up to 24 inches.

Other popular Big River sportfish are: rock bass, channel and flathead catfish, sunfish, crappie, and suckers. Most rock bass and crappie are caught in spring. MDC sampling has shown good numbers of quality-sized rock bass (Figure rf). Though channel and flathead catfish angling effort is difficult to determine, catfishing peaks in summer with many anglers using set lines. Several large (15-25 lbs) flatheads are reported each year. Sunfish (longear and green sunfish and bluegill) angling is best from May to September. Sucker gigging is popular in late fall and early winter, especially above RM 46, where boat access, water clarity, and sucker habitat is best. Fleener (1988) estimated that 44,008 fish (63% gigged suckers) were caught from Big River and the lower five miles of the Mineral Fork in 1979-80. In April-October, 1995, anglers caught an estimated 11,718 fish within the SBBSMA (unpublished data, K. Meneau, MDC).

Other basin streams with significant sport fisheries that are accessible to wade-anglers include: Mineral Fork, Fourche a Renault, Terre Bleue, Cedar, Clear, and Mill creeks.

Present Regulations

Statewide fishing regulations apply to basin streams. The exceptions are black bass regulations within the Big River SBBSMA. The purpose of these regulations (listed below) are to produce more and bigger smallmouth bass, while attempting to reduce the number of slow-growing spotted bass.

Big River SMBSMA Black Bass Regulations

The SBBSMA consists of the Big River from the Hwy. 21 bridge (near Washington State Park) to it's confluence with the Meramec River and Mineral Fork from the Hwy. F bridge (Washington County) to it's confluence with the Big River. Within the SBBSMA the following regulations apply:

Black Bass Daily Limit: six (6), only one (1) can be a smallmouth bass

Black Bass Length Limit: Largemouth bass = 12" minimum

Spotted bass = no length limit

Smallmouth bass = 15" minimum

Big River anglers support these regulations. MDC creel results show that 21% of anglers fished the SBBSMA more because of the regulations (unpublished data, K. Meneau, MDC). Four percent fished less and fishing effort was unchanged for 75% (unpublished data, K. Meneau, MDC). Some anglers asked for expansion of the Big River SBBSMA boundaries.

To help further reduce the spotted bass population within the Big River a change in regulations will take effect on March 1, 2002. On March 1, 2002, the daily limit for spotted bass will be twelve (12). The daily limit for largemouth bass will remain six (6) fish, and the daily limit for smallmouth bass will remain one (1) fish. Size limits will remain the same.

Aquatic Invertebrates

Mussels

Big River has a diverse mussel community. Thirty-four species of mussels (Table 9) have been found within basin streams (Buchanan 1980; Ryckman et al. 1973). Three species are of special concern and were sampled only in lower Big River. The pink mucket (Lampsilis abrupta) is Federally-endangered, while the scale shell (Leptodea leptodon) and spectacle case (Cumberlandia monodonta) are listed as rare in Missouri. Ryckman et al. (1973) and Buchanan (1980) found that Big River provided favorable mussel habitat throughout its length, except for a 46-mile section (RM 62.7-108.7) which is adversely affected by mine waste. River bed substrate has been covered with fine sediment, eliminating mussel habitat in this reach.

Crayfish

The Big River basin contains eight species of crayfish (Table 10; Pflieger), including the belted crayfish (Orconectes harrisoni), which is found only in Missouri and almost exclusively in the St. Francois and Big River basins (one isolated Meramec River sample at the mouth of Big River). With the exceptions of the golden crayfish (Orconectes luteus) and the devil crayfish (Cambarus diogenes), all species are found only in Ozark streams.

Aquatic Insects

The Big River basin benthos communities can be quite diverse (Ryck 1973; Kramer 1976; Duchrow 1976; MDC 1995d). Twelve orders, 55 families and 107 taxa of aquatic insects have been collected since 1976 (Appendix 8). Mayfly and stonefly nymphs were especially prevalent

(Ryck 1973; Duchrow 1976), generally indicating good water quality. In places, benthos populations are seriously affected by lead and barite mine waste (Ryck 1973; Duchrow 1976; Kramer 1976). Duchrow (1976) found that invertebrates with exposed gills like dobsonfly (Nigronis serricornis) larvae may become extirpated if mine waste is present.

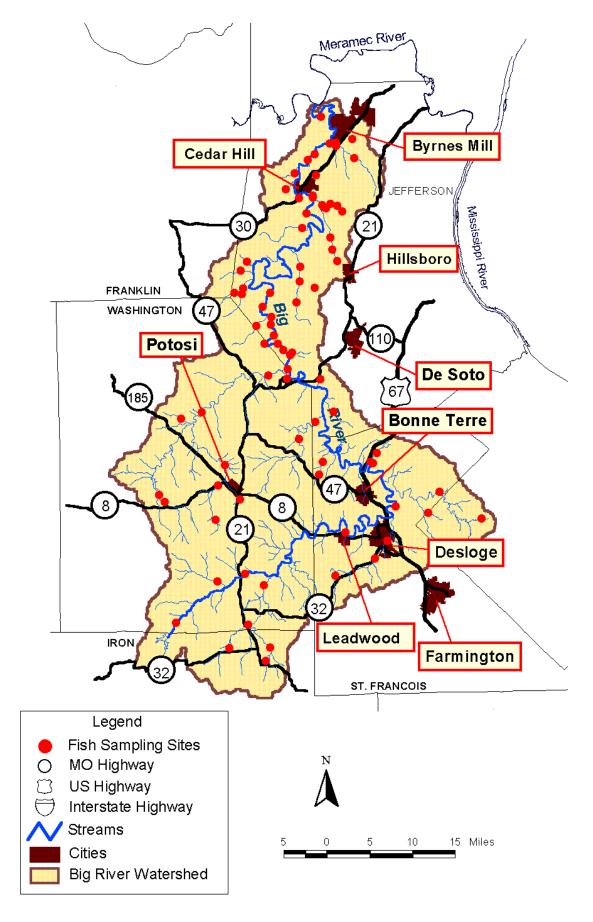


Figure fs. Fish samples within the Big River basin, Missouri.

Table 8. List of fish reported in Big River Basin, 1975-95.

SPECIES		Α	В	С	D	Е	F
Brook Lamprey	Ichthyomyzon fossor			Х			Х
Chestnut lamprey	Ichthyomyzon castaneus	Х					
Longnose gar	Lepisosteus osseus	Х	Х			Х	
Shortnose gar	Lepisosteus platostomus		Х			Х	
American eel	Anguilla rostrata	Х		Х		Х	Х
Gizzard shad	Dorosoma cepedianum	Х	Х			Х	
Alabama shad	Alosa alabamae		Х				
Mooneye	Hiodon tergisus	Х					
Rainbow trout	Oncorhynchus mykiss	Х					Х
Grass pickerel	Esox americanus	Х					Х
Common carp	Cyprinus carpio	Х	Х	Х	Х	Х	Х
Grass carp	Ctenopharyngodon idella					Х	
Golden shiner	Notemigonus crysoleucas	Х	Х				
Southern redbelly dace	Phoxinus erythrogaster	х	х				X
Southern redbelly dace x creek chub	P. erythrogaster x S. atromaculatus	х					
Bullhead minnow	Pimephales vigilax	X	X				
Bluntnose minnow	P. notatus	Х	Х				X
Fathead minnow	P. promelas	Х	Х				X
Hornyhead chub	Nocomis biguttatus	Х	X				X
Hornyhead chub x striped shiner	N. biguttatus x L chrysocephalus	х					
Bigeye chub	Notropis amblops	Х	Х				Х
Silver chub	Macrhybopsis storeriana		Х				
Speckled chub	M. aestivalis		Х				

Table 8 continued.

Gravel chub	Erimystax x-punctata	X	X				Х
Stoneroller spp.	Campostoma spp.		Х	Х			Х
Central stoneroller	Campostoma anomalum	Х					
Largescale stoneroller	C. oligolepis	х		Х			X
Ozark minnow	Notropis nubilus	Х	Х				Х
Suckermouth minnow	Phenacobius mirabilis	х	х				
Creek chub	Semotilus atromaculatus	Х	Х				Х
Silverjaw minnow	Notropis buccata	Х	Х				Х
Redfin shiner	Lythrurus umbratilis	Х	Х				Х
Spotfin shiner	Cyprinella spilopterus	Х	Х				Х
Steelcolor shiner	Cyprinella whipplei	Х	Х				х
Rosyface shiner	Notropis rubellus	Х	Х				х
Emerald shiner	Notropis atherinoides		Х	Х			Х
Bleeding shiner	Luxilus zonatus	Х	Х	Х			х
Striped shiner	L. chrysocephalus	Х	Х	Х			Х
Bigmouth shiner	Notropis dorsalis		Х				
Sand shiner	N. stramineus	Х	Х				Х
Bigeye shiner	N. boops	Х	Х	Х			х
Wedgespot shiner	N. greenei	Х	Х				
Mimic shiner	N. volucellus	Х	Х				х
Smallmouth buffalo	Ictiobus bubalus	х	х				
Quillback	Carpiodes cyprinus	Х	Х	Х		Х	
Highfin carpsucker	Carpiodes velifer	х	х	х		Х	
River carpsucker	Carpiodes carpio	Х	Х	Х		Х	
Northern hogsucker	Hypentelium nigricans	х	Х	Х	Х	Х	Х

Table 8 continued.

White sucker	Catostomus commersoni	X	Х				Х
Silver redhorse	Moxostoma anisurum	Х				Х	
Shorthead redhorse	M. macrolepidotum	х	x	х		х	
River redhorse	M. carinatum	Х	Х	Х		Х	
Black redhorse	M. duquesnei	Х	Х	Х		Х	Х
Golden redhorse	M. erythrurum	Х	Х	Х		Х	Х
Spotted sucker	Minytrema melanops	Х					
Creek chubsucker	Erimyzon oblongus						Х
Channel catfish	Ictalurus punctatus	Х	Х	Х	Х	Х	
Flathead catfish	Pylodictis olivaris	Х	Х	Х		Х	
Yellow bullhead	Ameiurus natalis	Х	Х	Х	Х	х	Х
Black bullhead	Ameiurus melas	Х		Х		Х	Х
Slender madtom	Noturus exilis	Х	Х				Х
Stonecat	N. flavus	Х	Х				
Freckled madtom	N. nocturnus	Х	Х				Х
Northern studfish	Fundulus catenatus	Х	Х				Х
Blackspotted topminnow	F. olivaceus	х	х				х
Blackstripe topminnow	F. notatus	х		х			х
Mosquitofish	Gambusia affinis		Х				Х
Brook silverside	Labidesthes sicculus	Х	Х				Х
Banded sculpin	Cottus carolinae	Х	Х				Х
Ozark sculpin	C. hypselurus	Х	Х				Х
Largemouth bass	Micropterus salmoides	Х	Х	Х	Х	Х	Х
Spotted bass	M. punctulatus		Х			Х	
Smallmouth bass	M. dolomieui	Х	Х	Х	Х	Х	Х
Warmouth	Lepomis gulosus					Х	Х

Table 8 continued.

Green sunfish	L. cyanellus	Х	Х	Х		Х	Х
Orangespotted sunfish	L. humilis	х	х		Х	Х	Х
Longear sunfish	L. megalotis	Х	Х	Х	Х	Х	Х
Bluegill	L. macrochirus	Х	X	X	X	Х	Х
Redear sunfish	L. microlophus				Х	Х	
Hybrid sunfish	species undetermined	Х				Х	Х
Green sunfish x Bluegill	L. cyanellus x L. macrochirus	х					
Rock bass	Ambloplites rupestris	Х	Х	Х	Х	Х	Х
Black crappie	Pomoxis nigromaculatus		Х				
White crappie	P. annularis	Х	Х			Х	Х
Walleye	Stizostedion vitreum	Х	Х			Х	
Sauger	S. canadense	Х	Х				
Crystal darter	Ammocrypta asprella	Х					
Western sand darter	Ammocrypta clara		Х				
Logperch	Percina caprodes	Х	Х			Х	Х
Slenderhead darter	P. phoxocephala	Х	Х				
Gilt darter	P. evides	Х	Х				Х
River darter	P. shumardi		Х				
Johnny darter	Etheostoma nigrum	Х	Х				Х
Greenside darter	E. blennioides	Х	Х				Х
Missouri saddled darter	E. tetrazonum	х	Х				Х
Banded darter	E. zonale	Х	Х				Х
Fantail darter	E. flabellare	Х	Х				Х
Rainbow darter	E. caeruleum	Х	Х				Х
Orangethroat darter	E. spectabile	х	Х				Х

Table 8 continued.

Freshwater drum	Aplodinotus grunniens	Х	Х			Х	
Collectors:	A) Pfleiger (1975)	A) Pfleiger (1975)					
	B) Mills et al. (1978)						
	C) G. Kromrey, 1978-79,81, MDC, unpublished data						
	D) S. Alcorn, 1980, MDC, unpublished data						
E) K. Meneau, 1987-95, MDC, unpublished data							
F) K. Meneau and A. Austin, et al., 1992-95, MDC, unpublished data				hed			
Outside range of distribution (as described by Plfeiger, 1975).							

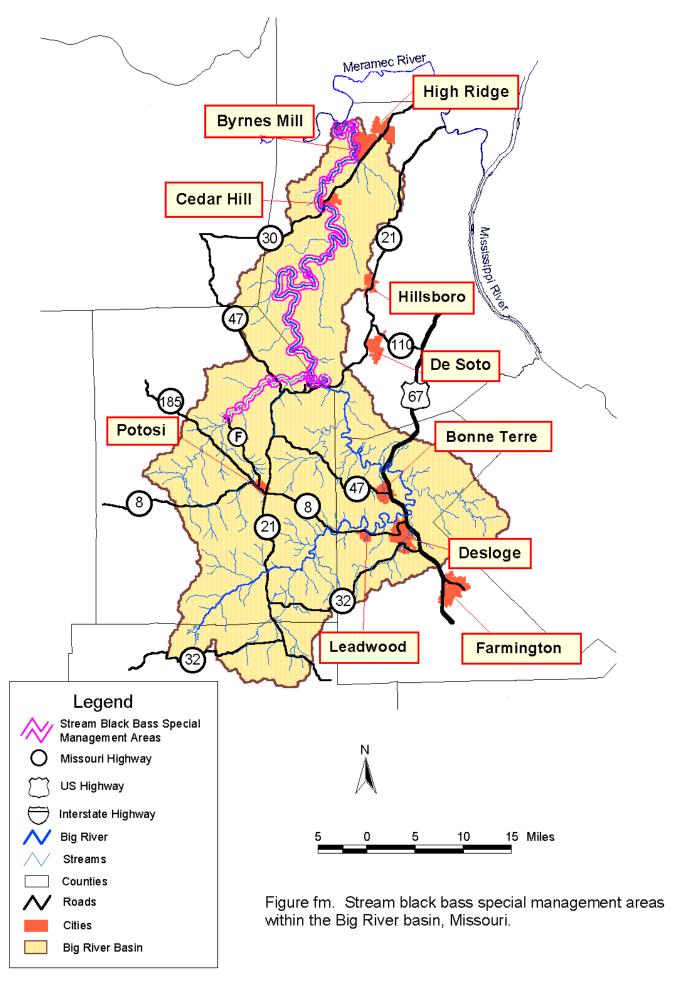


Figure sf. Big River SMBSMA smallmouth bass length frequency from electrofishing.

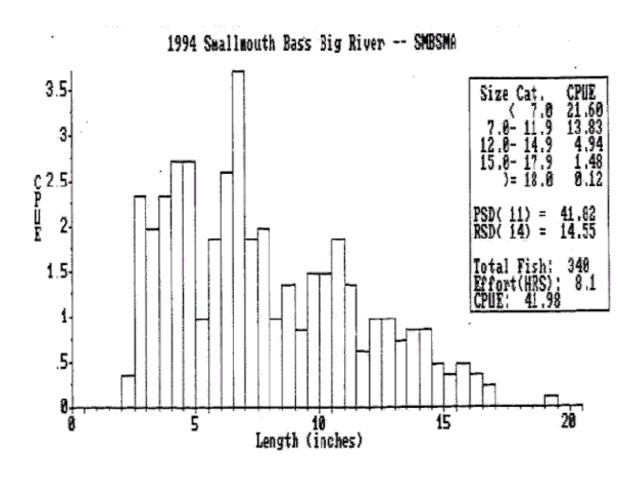


Figure rf. Big River SMBSMA rock bass length frequency from electrofishing.

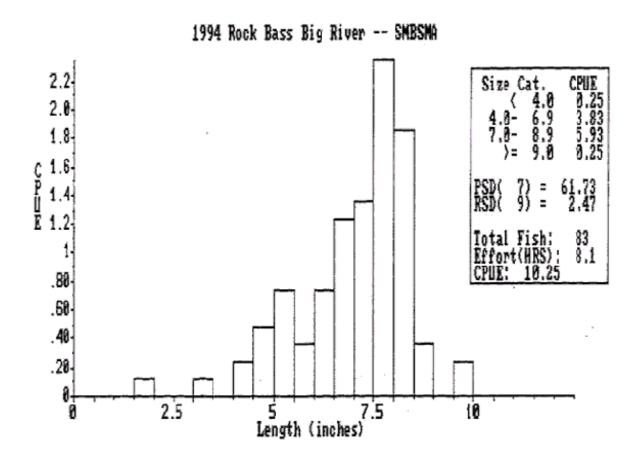


Table 9. Mussels found within the Big River Basin (Buchanan 1980, Ryckman et al. 1973)

Common Name	Scientific Name
Spectacle case	Cumberlandia monodonta
Paper floater	Anodonta imbecilus
Giant floater	Anodonta grandis grandis
Squaw foot	Strophitus undulatus undulatus
Elk toe	Alasmidonta marginata
Slipper shell	Alasmidonta viridis
White heel-splitter	Lasmigona complanata
Fluted shell	Lasmigona costata
Washboard	Megalonaias nervosa
Pistol-grip	Tritigonia verrucosa
Monkey-face	Quadrula metanevra
Pimple-back	Quadrula pustulosa
Three-ridge	Amblema plicata
Wabash pig-toe	Fusconaia flava
Round pig-toe	Pleurobema sintoxia
Lady-finger	Elliptio dilatata
Three-horned warty-back	Obliquaria reflexa
Mucket	Actinonaias ligamentina carinata
Ellipse	Venustaconcha ellipsiformis ellipsiformis
Butterfly	Ellipsaria lineolata
Deer-toe	Truncilla truncata
Fawn's foot	Truncilla donaciformis
Scale shell	Leptodea leptodon
Fragile paper shell	Leptodea fragilis
Pink heel-splitter	Potamilis alatus

Table 9 continued.

Pink paper shell	Potamilus ohioensis
Liliput shell	Toxolasma parvus
Black sand shell	Ligumia recta
Slough sand shell	Lampsilis teres teres
Yellow sand shell	Lampsilis teres anodontoides
Fat mucket	Lampsilis radiata luteola
Pink mucket	Lampsilis abrupta
Pocketbook	Lampsilis ventricosa
Britt's mussel	Lampsilis reeviana brittsi

Table 10. Crayfish present in Big River basin (Pflieger 1996).

Common Name	Scientific Name
Freckled crayfish	C. maculatus
Belted crayfish	Orconectes harrisoni
Woodland crayfish	O. hylas
Golden crayfish	O. luteus
Spothanded crayfish	O. punctimanus
Northern crayfish	O. virilis
Saddledback Crayfish	O. medius
Devil crayfish	<u>Cambarus</u> <u>diogenes</u>

Appendix 9. Aquatic invertebrates of the Big River basin.

EPHEMEROPTERA (Mayflies)	
<u>Baetiscidae</u>	Baetisca bajkovi
<u>Potamanthidae</u>	<u>Potamanthus</u>
<u>Polymitarcyidae</u>	Ephoron album
Ephemeridae	<u>Ephemera</u>
	Ephemera guttulata
	<u>Hexagenia</u> <u>limbata</u>
	Ephemera simulans
<u>Tricorythidae</u>	<u>Tricorythodes</u>
<u>Caenidae</u>	<u>Caenis</u>
Ephemerellidae	<u>Ephemerella</u>
	Ephemerella invaria
	Ephemerella bicolor
	<u>Ephemerella</u> <u>serrata</u>
<u>Heptageniidae</u>	<u>Heptagenia</u>
	<u>Heptagenia lucidipennis</u>
	Heptagenia maculipennis
	<u>Rhithrogena</u>
	Stenonema pulchellum
	S. nepotellum
	S. ares
	S. bipunctatum
	S. tripunctatum
	S. interpunctatum
	S. integrum

	T
	S. lutem
	<u>Stenocron</u>
<u>Leptophlebiidae</u>	<u>Choroterpes</u> <u>basalis</u>
	<u>Leptophlebia</u>
	<u>Paraleptophlebia</u>
	Paraleptophlebia praepedita
<u>Oligoneuriidae</u>	<u>Isonychia</u>
<u>Siphonuridae</u>	<u>Siphlonurus</u> <u>marshalli</u>
<u>Baetidae</u>	Baetis amplus
	<u>Baetis</u>
	<u>Centroptilum</u>
	<u>Psuedocloeon</u>
ODONATA (dragonflies and damsmselflies)
<u>Calopterygidae</u>	<u>Hetaerina americana</u>
Coenagrionidae	<u>Argia</u>
Gomphidae	Gomphus
	<u>Lanthus</u>
	<u>Progomphus</u>
PLECOPTERA (stoneflies)	
<u>Pteronarcyidae</u>	<u>Pteronarcys</u>
	<u>Pteronarcys</u> <u>dorsata</u>
<u>Nemouridae</u>	Brachyptera faciata
	<u>Leuctra</u>
	<u>Nemoura</u>
	<u>Patacapnia</u>
	<u>Taeniopteryx</u>
	T. nivalis

Perlidae	<u>Acronueria</u>	
	Agnetina capitata	
	Neoperla clymeme	
	<u>Paragnetina</u>	
	<u>Paraperla</u>	
	<u>Perlesta</u>	
	Perlesta placida	
	<u>Perlinella</u>	
	Perlinella ehyre	
Perlodidae	<u>Hydroperla crosbyi</u>	
	H. natala	
	<u>Isogenus</u>	
	<u>Isoperla</u> <u>bilineata</u>	
	<u>I. richardsoni</u>	
	I. clio	
	I. duplicata	
	I. marlynia	
	<u>I. mohri</u>	
<u>Capniidae</u>	<u>Allocapnia</u>	
HEMIPTERA (true bugs)		
<u>Corixidae</u>	<u>Trichocorixa</u>	
<u>Veliidae</u>	<u>Microvelia</u>	
	<u>Rhagovelia</u>	
<u>Gerridae</u>	<u>Gerris</u>	
MEGALOPTERA (alderflies, dobsonflies)		
<u>Sialidae</u>	<u>Sialis</u>	
Corydalidae	Corydalus cornutus	
	Nigronia serricornis	

LEPIDOPTERA (moths)				
<u>Pyralidae</u>	<u>Paragyractis</u>			
TRICHOPTERA (caddisflies)				
<u>Helicopsychidae</u>	<u>Helicopsyche</u>			
<u>Hydropsychidae</u>	<u>Cheumatopysche</u>			
	<u>Hydropsyche bifida</u>			
	H. cuanis			
	H. betteni			
<u>Hydroptilidae</u>	<u>Agraylea</u>			
	<u>Ithytrichia</u>			
	<u>Ochrotrichia</u>			
	<u>Oxyethira</u>			
<u>Leptoceridae</u>	<u>Athripsodes flavus</u>			
	<u>Oecetis</u>			
<u>AMPHIPODA</u>				
<u>Gammaridae</u>	<u>Gammarus</u>			
<u>Talitridae</u>	<u>Hyalella azteca</u>			
<u>ISOPODA</u>				
<u>Asellidae</u>	<u>Asellus</u>			
COLEOPTERA (beetles)				
Elmidae	Ancyronyx variegata			
	<u>Dubiraphia</u>			
	Macronychus glabratus			
	<u>Optioservus ozarkensis</u>			
	<u>Stenelmis</u>			
<u>Curculionidae</u>	<u>Onychylis</u>			
<u>Haliplidae</u>	<u>Peltodytes</u>			
<u>Hydrophilidae</u>	<u>Berosus</u>			

Limnichidae	Lutrochus laticeps
Gyrinidae	<u>Dineutus</u>
<u>Dytiscidae</u>	<u>Hydroporus undulatus</u>
<u>Psephenidae</u>	Ectopria nervosa
	<u>Psephenus herricki</u>
<u>Dryopidae</u>	<u>Dryops</u>
	<u>Helichus lithophilus</u>
DIPTERA (true flies)	
<u>Chironomidae</u>	<u>Chironomus</u>
Simuliidae	<u>Simulium</u>
Empididae	
<u>Stratiomyiidae</u>	
<u>Muscidae</u>	
<u>Chaoboridae</u>	
<u>Dolichopodidae</u>	
<u>Dixidae</u>	<u>Dixa</u>
<u>Tipulidae</u>	<u>Antocha</u>
	<u>Eriocera</u>
	<u>Tipula</u>
<u>Tabanidae</u>	<u>Chysops</u>
Rhagionidae	Atherix variegata
<u>Ceratopogonidae</u>	<u>Bezzia</u>
	<u>Forcipomyia</u>
	<u>Pericoma</u>